

SECTION 1000

LANDSCAPE CONSTRUCTION

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SECTION 1000 LANDSCAPE CONSTRUCTION

1001.00 GENERAL CONDITIONS

LANDSCAPING THAT IS PRIVATELY OWNED AND MAINTAINED BY A HOMEOWNERS ASSOCIATION (HOA) OR OTHER PROPERTY MANAGEMENT ENTITY SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THESE CONSTRUCTION STANDARDS & SPECIFICATIONS. COMPLIANCE TO THESE CONSTRUCTION STANDARDS & SPECIFICATIONS SHALL BE CERTIFIED BY A QUALIFIED THIRD PARTY APPROVED BY ELBERT COUNTY. Construction shall not commence until the construction plans are approved by Elbert County.

Landscape Plans shall be included with all residential subdivisions over 4 lots, commercial subdivisions, PUD's, and industrial proposals.

Refer to Section 100 TITLE, SCOPE, AND GENERAL CONDITIONS of these CONSTRUCTION STANDARDS & SPECIFICATIONS for additional requirements that apply to all projects within Elbert County.

1010.00 SITE DESIGN AND PREPARATION

Site preparation shall be completed in accordance with Section 300.00 SITE WORK AND EARTHWORK of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

Grades shall not exceed 4:1 (horizontal:vertical) in shrub beds, mulched areas, or turf areas. Landscaping at intersections shall conform to sight line "triangles" that are selected for ten (10) MPH more than the posted speed limit. Grades shall be designed to not drain onto residential lots.

1020.00 TOPSOIL PREPARATION

1021.0 General

The Contractor shall provide all labor, equipment and materials necessary to complete the topsoil preparation for seeding and/or sodding as required by the approved plans and these CONSTRUCTION STANDARDS & SPECIFICATIONS.

If the area to be developed is undisturbed or infested with bindweed, Canadian thistle, or any other noxious or objectionable weeds, the vegetation shall be controlled by a chemical application of Round-up at a rate recommended on the chemical's label for controlling all existing vegetation. All applicable portions of Section 333.04 Topsoil of these CONSTRUCTION STANDARDS & SPECIFICATIONS shall apply.

1022.00 Materials

1022.01 Organic Materials

Organic material shall be a certified Class I or II compost product, depending upon specific project applications. Lab analysis of the organic material shall be submitted for approval prior to delivery. Organic materials shall contain less than 10 mmhos/cm of soluble salts and shall have a pH in the range of 6.0-8.2 and a 30-35% moisture content. Because of the difference in moisture content of organic materials, certification of material volume may be required.

Organic materials shall be applied at a rate of five (5) cubic yards per one-thousand (1,000) square feet.

1022.02 Starter Fertilizer

Complete starter fertilizer shall be a complete starter fertilizer having the chemical analysis of Nitrogen-18, Phosphorous-46, Potash-0. Fertilizer shall be delivered to the site in new, unopened bags bearing the manufacturer's name and the chemical analysis. Fertilizer shall conform to all Colorado Department of Agriculture fertilizer laws.

Starter fertilizer shall be applied at five (5) pounds per one-thousand (1000) square feet after fine grading is complete and before sod or seed is planted.

1023.00 Process

The Contractor shall cultivate the area to be sodded/seeded to a depth of six inches (6") to remove weeds and other plants that may interfere with turf establishment. All stones, sticks, and debris larger than two (2) inches in diameter shall be removed. Prior to sodding/seeding, the Contractor shall uniformly apply organic materials and starter fertilizer at the rates specified to a depth of six (6) inches with a disc, rototiller, or other suitable tilling equipment. Organic materials shall be applied when the surface is within two-tenths (0.2) of a foot of final grade. No organic material containing manure shall be stockpiled on the site for more than eight (8) hours before it is incorporated into the soil. After tilling, the areas to be sodded/seeded shall be raked, graded, and rolled to final grade with gently sloping surfaces to adequately drain surface water run-off. The finished surface shall be even and uniform, with no soil clumps or debris larger than two (2) inches in diameter. The prepared soil surface shall be on an even plane with all sidewalks, curbs, or borders for seeded areas and shall be three-fourths ($\frac{3}{4}$) inch below for sodded areas.

IN NO CASE SHALL SLOPES OF SODDED OR SEEDED AREAS EXCEED FOUR (4) HORIZONTAL TO ONE (1) VERTICAL (4:1).

1024.00 Inspections

Required inspections shall include Materials, Soil Preparation and Tree, Shrub and Perennials. The Contractor shall request required inspections at least twenty-four (24) hours in advance.

1024.01 Materials Inspection

Elbert County may inspect all organic materials and fertilizer upon delivery. Unsatisfactory materials shall be removed. Weight tickets for all materials shall be submitted to Elbert County with the square footage to be amended. The Elbert County Inspector/Representative may confirm receipt of the order before materials are placed.

1024.02 Soil Preparation Inspection

Elbert County may inspect the soil preparation for conformance to the approved plans and these CONSTRUCTION STANDARDS & SPECIFICATIONS during or immediately following the completion of each segment of the preparation. Any workmanship deemed by Elbert County to be faulty or not in conformance with the approved plans and these CONSTRUCTION STANDARDS & SPECIFICATIONS shall be corrected. Following is the sequence of required inspections:

- A. During or after first cultivation
- B. After application of specified organic materials
- C. During or after second cultivation
- D. After final grade is complete

1024.03 Tree, Shrub and Perennial Inspection

Elbert County may inspect plant materials for conformance to the approved plans and these CONSTRUCTION STANDARDS & SPECIFICATIONS. Unsatisfactory plant material shall be rejected. Inspections may be performed onsite for projects with less than twenty (20) plants and at the supplying nursery for projects with twenty (20) or more plants. All warranty replacement of plant materials shall be performed during the spring or early fall, regardless of when the warranty period ends.

1030.00 SEEDING SPECIFICATIONS

1031.00 General

The Contractor shall provide all labor, equipment and materials necessary to furnish and install seed as required by the approved plans and these CONSTRUCTION STANDARDS & SPECIFICATIONS. Prior to installation, seed specs shall be coordinated with and approved by the Elbert County Soil Conservation District.

The mixture or blend of grass to be used, along with the seeding rate, shall be determined by a designated County representative. In this determination the following criteria may be taken into consideration:

- A. Location of seeding
- B. Intended purpose of the area
- C. Irrigation
- D. Erosion control
- E. Slope of terrain
- F. Aesthetics
- G. Availability of grass seed
- H. Maintenance requirements
- I. Compatibility with surrounding areas

1032.00 Materials

1032.01 Topsoil

Refer to Section 1020.00 Topsoil Preparation of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1032.02 Starter Fertilizer

Refer to Section 1020.00 Topsoil Preparation of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1032.03 Bluegrass Seed

Seed shall be furnished in sealed, unopened, standard containers and labeled in accordance with the USDA Rules and Regulations and the Federal Seed Act. Seed shall be fresh, clean, pure live seed equal in quality to the standards for "Certified Seed" and shall pass the USDA test for germination of eighty-five (85) percent and for purity of ninety (90) percent. Seed shall be free of *Poa annua* and all noxious or objectionable weed and shall have a maximum weed crop of one-tenth (0.1) percent. Elbert County may require tests of seed verification at the Contractor's expense. Seed specifications and application rate may vary based on projected land use.

Bluegrass seed shall be applied at the rate of one hundred fifty (150) pounds per acre. The seed mixture shall consist of a blend of four (4) varieties of bluegrass. Seed specifications may vary based on projected land use.

1032.04 Native Seed

Seed shall be furnished in sealed, unopened, standard containers and labeled in accordance with the USDA Rules and Regulations and the Federal Seed Act.

Seed shall be fresh, clean, pure live seed equal in quality to the standards for "Certified Seed". Elbert County may require tests of seed verification at the Contractor's expense. Seed specifications and application rate may vary based on projected land use.

1032.05 Top Dressing

Hydro-mulch shall be a one hundred (100) percent wood cellulose fiber and shall be applied at a minimum rate of two thousand (2,000) pounds per acre with a three (3) percent tacifier. Hydromulch shall be applied immediately after seed application.

Straw shall be certified weed-free and shall be used on native seeding only. Straw shall be applied over the seeded surface at the minimum rate of two thousand (2,000) pounds per acre and with partial embedment into the soil by a crimper or similar implement. Straw shall be applied immediately after seed application.

1033.00 Seeding Process

1033.01 Bluegrass Seeding

Seed shall be applied using a Brillion seeder or approved equal to drill the seed into the prepared seedbed. The seeder shall be equipped with a satisfactory feeding mechanism, an agitator, double disc furrow openers, depth bands and packer wheels. Seed shall be sown to a depth of one-quarter ($\frac{1}{4}$) inch into the prepared seedbed. Seed drilling shall be performed in two (2) separate applications, crossing the area at right angles to one another to guarantee proper coverage. On sloping land, the final seeding operation shall follow the general contour. Top-dressing shall be applied immediately after seed application.

In areas where seed drilling is not feasible, a broadcast method may be substituted. If a broadcast method is used, the seeding rate shall be doubled and the area shall be dragged after seeding and top-dressing applied.

ALL SEEDING SHALL OCCUR BETWEEN OCTOBER 1ST AND APRIL 30TH UNLESS APPROVED IN WRITING BY THE ROAD & BRIDGE SUPERINTENDENT / ELBERT COUNTY ENGINEER.

1033.02 Native Seeding

Seed shall be applied by seed drilling. Seed shall be sown to a depth of one-half ($\frac{1}{2}$) inch into a prepared seedbed. On sloping land, the seed shall be applied following the general contour. Top-dressing shall be applied immediately after seed application.

In areas where seed drilling is not feasible, a broadcast method may be substituted. If a broadcast method is used, the seeding rate shall be doubled and the area shall be dragged after seeding and top-dressing applied.

ALL SEEDING SHALL OCCUR BETWEEN OCTOBER 1ST AND APRIL 30TH UNLESS APPROVED IN WRITING BY THE ROAD & BRIDGE SUPERINTENDENT / ELBERT COUNTY ENGINEER.

1034.00 Intentionally Left Blank

1035.00 Maintenance Procedures for Bluegrass

The Contractor shall guarantee the health of the stand of grass until the entire project has been accepted by end user. Any new grass deemed by Elbert County to be thin, weak, or dead shall be reseeded according to these CONSTRUCTION STANDARDS & SPECIFICATIONS and germinated prior to the beginning of the warranty period.

The Contractor shall erect suitable signs at strategic points notifying the public to keep off the seeded areas until the lawn is well established. Any traffic damage that may occur prior to final acceptance of the work shall be repaired and reseeded at the Contractor's expense.

1035.01 Mowing

During the maintenance period, after a suitable stand of grass has been established, the Contractor shall mow all lawn areas on a routine basis using a mowing height of three inches and one half (3 ½) inches. Frequency of mowing shall be determined by the growth rate of the grass but at no time should the clippings exceed more than 1/3 the total leaf blade.

Only turf-type mowers shall be used for this operation.

1035.02 Additional Fertilizing

At the time of the first mowing, the Contractor shall apply a commercial fertilizer with the chemical analysis of Nitrogen-20, Phosphorous-10, Potash-5, plus two (2) percent iron at the rate of five (5) pounds per one thousand (1,000) square feet. When applied, the fertilizer shall be dry and free-flowing, and care should be taken to prevent burning. Fertilizer containing iron shall be cleaned off from any structures or concrete areas. Any areas disturbed or damaged by the Contractor during fertilizing operations shall be repaired in accordance with these CONSTRUCTION STANDARDS & SPECIFICATIONS at the Contractor's expense.

1035.03 Watering

The Contractor shall be responsible for watering the seeded area(s) a minimum of two (2) times per day (early-morning and early evening) and for keeping areas moist until the lawn is established. The Developer shall be responsible for the cost of water usage until acceptance by HOA or POA. HOA or POA shall be responsible for the cost of water usage from the time of acceptance going forward. If the subdivision well does not all outside watering of landscaping, developers shall bring the necessary water to the site.

1036.00 Inspections

Inspections shall be completed in accordance with Section 1024.00 Inspections of these CONSTRUCTION STANDARDS & SPECIFICATIONS. The Contractor shall notify Elbert County for inspections of seed certification and germination.

1036.01 Inspection of Seed Certifications

Seed certification tags shall be delivered to Elbert County to verify compliance with these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1036.02 Germination Inspection

When germination is complete and plants are visible, the Contractor shall notify Elbert County and request a germination inspection for approval in order to begin the warranty period. Any areas determined by Elbert County to be thin, weak or dead shall be replaced. All washouts shall be reseeded immediately after the germination inspection. No partial acceptance shall be made.

1040.00 SODDING SPECIFICATIONS**1041.00 General**

The Contractor shall provide all labor, equipment and materials necessary to furnish and install all sod as required by the approved plans and these CONSTRUCTION STANDARDS & SPECIFICATIONS. The use of low water consumptive grasses and native ornamental grasses are encouraged.

1042.00 Materials**1042.01 Topsoil**

Topsoil preparation shall be as described in Section 1020.00 Topsoil Preparation of these CONSTRUCTION STANDARDS & SPECIFICATIONS[RCS1].

1042.02 Starter Fertilizer

All fertilizer shall meet the requirements of Section 1020.00 Topsoil Preparation of these CONSTRUCTION STANDARDS & SPECIFICATIONS. A starter fertilizer with a chemical analysis of Nitrogen-12, Phosphorous-12, Potash-4, with four (4) percent iron and eight (8) percent sulfur shall be applied at a rate of five (5) pounds per one thousand (1,000) square feet immediately prior to sodding.

1042.03 Sod

The sod shall consist of a blend of at least three (3) varieties of bluegrass. This blend is to be approved by the Elbert County Inspector/Representative prior to installation. Variety of sod may vary based on projected land use. An approved variety of drought tolerant sod shall be used in passive park and right of way areas to assure low water use. Approved athletic grass blends of grass shall be used in high use park areas and on athletic fields.

Sod shall be strongly rooted and free of noxious weeds, undesirable plants, roots, stones, and other foreign materials that shall be detrimental or shall hinder proper development of the sod. The sod shall be procured from areas where the soil is reasonably fertile and contains a high percentage of loamy topsoil. The sod shall be cut from living, thickly matted turf. The sod shall be mowed to a height not to exceed two and one half (2 ½) inches and thoroughly watered before the sod is cut. All sod shall be cut to provide a minimum thickness of three-fourths (3/4) inch of soil adhering to the roots. The Contractor shall furnish written proof of sod variety to Elbert County. Sod shall be tested by the Colorado State University laboratory or a certified laboratory at the Contractor's expense if requested by Elbert County.

1043.00 Sodding Process

1043.01 Care and Handling

Care shall be exercised at all times to retain native soil on the sod roots during transportation, handling and planting. Dumping sod from vehicles shall not be permitted. The sod shall be transported to the site within twenty-four (24) hours from the time it is cut, unless it can be stored to the satisfaction of Elbert County. During delivery and while in stacks, all sod shall be kept moist and protected from exposure to the wind, sun and freezing. All sod delivered to the site shall be installed within 24 hours of delivery. All damaged or dry sod shall be rejected.

1043.02 Transporting Sod On-Site

Sod may be transported on or across the site on pallets by forklift. Damage to the sod bed by vehicles shall be kept to a minimum and shall be regraded before sodding of the area. Damage caused to paving, curbs, fence, plants or other objects during sodding, shall be repaired or replaced by the Contractor at his expense as directed by Elbert County.

1043.03 Sodding

The sod bed shall be lightly watered immediately prior to installing the sod. All sod strips shall be placed tightly against each other so no open joints are apparent. Joints between ends of strips shall be staggered at least one (1) foot between adjacent rows. At the end of walks and drives, the sod shall have the same finish grade as the abutting surfaces. At curbs, the sod shall have the same finish grade as the top of the curb. Sod placed on slopes equal to four horizontal to one vertical (4:1) shall be staked with wire pins not less than six (6) inches long and spaced not more than thirty (30) inches apart. The pins shall be driven into the ground at an angle against the flow of the water until the top of the stake is just below the top of the soil and root mat. Sod shall be installed at the bottom of the slope and shall progress upward with strips laid transverse to the slopes. Immediately after the sod has been laid, it should be tamped or rolled with approved equipment to eliminate all air pockets and to provide a smooth, even surface. Immediately after rolling or tamping the sod, sufficient water shall be applied to completely saturate the sod. The sod shall be watered as often as required to prevent drying out. In settled areas, the sod shall be removed, settled areas shall be regraded and the sod shall be reinstalled.

1044.00 Clean-up

All debris and surplus materials shall be removed from the site. All disturbed areas shall be restored to original condition or to the required new condition.

1045.00 Maintenance

The proper care and maintenance of the sodded areas shall be the responsibility of the Contractor until the work has been accepted. The maintenance operations shall begin as soon as each portion of the area is sodded. Maintenance shall consist of repair and replacement of eroded areas, watering, mowing (once sod is established), weeding, fertilizing, and re-sodding as necessary to provide an even, consistent stand of grass. All sod replacement required by Elbert County shall be done at the Contractor's expense.

1045.01 Mowing

During the maintenance period, after a suitable stand of grass has been established, the Contractor shall mow all lawn areas on a routine basis using a mowing height of three and one half (3 ½) inches. Frequency of mowing shall be determined by the growth rate of the grass but at no time should the clippings exceed more than one-third (⅓) the total leaf blade.

Only turf-type mowers shall be used for this operation.

1045.02 Additional Fertilizing

At the time of the first mowing, the Contractor shall apply a commercial fertilizer with the chemical analysis of Nitrogen-20, Phosphorous-10, Potash-10, plus two (2) percent iron and eight (8) percent sulfur at the rate of five (5) pounds per one thousand (1,000) square feet. When applied, the fertilizer shall be dry and free-flowing, and care should be taken to prevent burning. Fertilizer containing iron shall be cleaned off from any structures or concrete areas. Any areas disturbed or damaged by the Contractor during fertilizing operations shall be repaired in accordance with these CONSTRUCTION STANDARDS & SPECIFICATIONS at the Contractor's expense.

1045.03 Watering

The Contractor shall be responsible for watering the seeded area(s) a minimum of two (2) times per day (early-morning and early evening) and for keeping areas moist until the lawn is established. The Developer shall be responsible for the cost of water usage until Construction Acceptance of the project.

1046.00 Inspections

Inspections shall be completed in accordance with Section 1024.00 Inspections of these CONSTRUCTION STANDARDS & SPECIFICATIONS. The Contractor shall notify Elbert County for inspection of sod installation.

When sod installation is complete, the Contractor shall notify Elbert County and request a sod inspection for approval, in order to begin the warranty period. Any areas determined by Elbert County to be thin, weak or dead shall be replaced. No partial acceptance shall be made.

1050.00 LANDSCAPE IRRIGATION SYSTEMS**1051.00 General**

All irrigation design plans and specifications shall be submitted to Elbert County in accordance with Section 160.00 PLANS AND SPECIFICATIONS and Section 161.00 Construction Plan Requirements of these CONSTRUCTION STANDARDS & SPECIFICATIONS. The contractor is responsible for proper landscape irrigation system coverage. Landscape irrigation system design shall ensure that only planted areas are irrigated and not paved surfaces. The Road & Bridge Superintendent / Elbert County Engineer shall review and approve the design plans prior to the commencement of any work.

1051.01 Turn-over Items

Upon installation of an irrigation system, the Contractor shall furnish the end user (HOA, POA, Metro District, or Elbert County) with the following items:

- A. (1) Quick Coupler Key RB 55K-1 with Hose Swivel RB SH-1
- B. (1) Drain Key
- C. (1) Slotted and (1) square nut key
- D. (2) Control Clock Keys
- E. (1) Valve Box Key
- F. (2) Irri-Tools
- G. Open End or Box Wrenches, (1) 7/16" and (1) 1/2"
- H. Transceiver Compatible with Controller
- I. Battery Charger
- J. Extra Battery
- K. Belt Clip
- L. Laminated 11"x17" as-built drawings for each controller with:
 - Color-coded valves and zones
 - Zone listing that shows the precipitation per valve, type of head per valve, and gallons per valve

1052.00 Materials**1052.01 Water License and Tap Fee**

The Developer shall purchase a water license and pay all applicable tap and meter fees prior to connecting into the applicable Metro District or Elbert County's water system. The size of the water tap shall be determined and approved by the Elbert County Chief Building Official and/or the Road & Bridge Superintendent / Elbert County Engineer.

1052.02 Water Tap

All taps into District or Elbert County water mains shall comply with the requirements of Section 440.00 WATER SERVICE LINE CONSTRUCTION of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1052.03 Water Service Line

All taps into District or Elbert County water mains shall comply with the requirements of Section 440.00 Water Service Line Construction of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1052.04 Meter Pit

Meter pits for drains shall be supplied by the Contractor. Meters one and one-half (1 1/2) inches and larger shall include a one (1) inch ball stop drain valve on the downstream side of the meter.

1052.05 Water Meter

The water meter shall be provided by the contractor.

1052.06 Electrical Service

All electrical service lines shall be run underground and in electrical PVC conduit with a minimum of eighteen (18) inches cover. All wire shall be copper and shall be properly sized. When the irrigation controller is the only electrical service demand, a twenty (20) amp minimum metered service shall be installed. If a booster pump is required, a sixty (60) Amp (minimum) metered service shall be installed. If the irrigation controller is the only electrical demand, an un-metered flat rate service can be installed. All electrical service lines shall have yellow electrical warning tape in the trench six (6) inches above the conduit pipe. An electrical disconnect shall be mounted on the irrigation controller. Solar powered controllers may be allowed with approval by the Road & Bridge Superintendent / Elbert County Engineer.

1052.07 Backflow Prevention

All backflow preventers shall be sized in accordance with manufacturer's recommended velocities, but no velocities shall exceed the normal industrial practice of seven and one-half (7 ½) feet per second through the backflow device. The device shall meet the requirements of ASSE Standard 1013; AWWA Standard Code C 506-78; and USC Foundation for Cross Connection Control and Hydraulic Research, latest edition.

Backflow preventers shall be installed in accordance with the applicable sections of the UBC. It shall have either a brass union or a bolted flange connection on both the inlet and discharge side of the device.

It shall be the responsibility of the contractor to have certified tests made of all installed backflow prevention devices.

Backflow preventers for water taps that are two (2) inches and smaller shall be a FEBCO 825-Y or 825 YA Series. Each backflow preventer shall be enclosed in a locked, stainless steel strong box with the following features:

- A. Marine grade aluminum alloy construction
- B. 100% stainless steel hardware
- C. Flush-mounted, locking mechanism for security
- D. Full-release locking mechanism for service and repair access
- E. Pre-punched viewing ports

The enclosure shall be permanently affixed to the concrete pad with a ¾" x 6" lag anchor bolt and twenty-four (24) inches of Grade 70 transport chain permanently

fixed on the end of the enclosure without a padlock. Backflow preventer enclosures shall be centered on a concrete pad with a twelve (12) inch mow strip border. The pad shall be a minimum of six (6) inches thick and all piping shall have a PVC sleeve a minimum of one (1) inch larger than pipe size.

Strong boxes shall be sized in accordance with manufacturer's recommendations, and shall be approved by the Road & Bridge Superintendent / Elbert County Engineer.

For taps two and one-half (2 ½) inches and larger, the backflow prevention device shall be a FEBCO 860 or FEBCO 880 Series.

1052.08 Booster Pump

The requirement for a booster pump shall be determined by water main static pressure and the design requirements of the irrigation system. When a booster pump is needed, it shall be a Peerless-type P.E., or equal, with magnetic starter and heater and a motor minder to monitor the pump and shut it down if necessary. The starter, heater and motor minder shall be in a vandal resistant water tight enclosure approved by the Road & Bridge Superintendent / Elbert County Engineer. All pumps shall include a bypass.

1052.09 Pump Enclosures

Pump enclosures shall protect equipment to thirty (30) degrees below zero. Pump house may be cast-in-place or precast concrete. Fabrication drawings shall be submitted to Elbert County for approval prior to delivery. The pump house shall have an exposed aggregate finish; heavy duty aluminum powder coated door and door jamb; non-locking door knob with latch; and a heavy duty slide bolt hasp assembly secured with a padlock. The pump house shall enclose all above ground, plumbing, such as piping fittings, backflow preventer, and booster pump; all electrical equipment, such as breaker panels, switches, overhead light and outlets; and irrigation controllers, heater, and ventilation. It shall have a minimum ceiling height of seven (7) feet.

All electrical equipment shall be Square D, Cuttler Hammer, G.E., or equivalent and a waterproof type. All wire shall be copper conductor and installed in conduit. Contractor shall submit detailed drawings of equipment. An alternate pump enclosure may be a pre-manufactured enclosure with all of the aforementioned features with approval by the Road & Bridge Superintendent / Elbert County Engineer.

1052.10 Controllers

The controller shall be housed in a stainless steel enclosure. It shall feature a pump start, manual advance switch, lightning protection, manual operating mode,

data retrieval, flow sensing and flow control. Each controller shall have a maximum of forty-eight (48) stations, which shall include a minimum of four (4) spare stations. Controller shall be properly grounded with an eight (8) foot long solid copper grounding rod to achieve a seven (7) ohm or less grounding quality.

1052.11 Master Valves and Zone Valves

Master valves shall be installed at all connection points and shall be a Bermad 910-P Opto-switch Pulse Transmitter or a Elbert County approved master valve with a Data Industrial IR22OP flow sensor.

All zone valves shall be preceded by a ball valve and shall include a threaded PVC union on the lateral line (upstream) side. The zone valves shall be Rainbird EFB-CP or equivalent for zone valves two (2) inches and smaller. Three (3) inch or larger zone valves shall be Rainbird 300-BPE-PRS-D or equivalent. Zone valves shall be operated with a twenty-four (24) volt solenoid and shall be capable of allowing compressed air to flow through them. Where working pressure exceeds 80 psi, a PRS-D or approved equal regulator shall be required where pop up, drip or bubbler irrigation equipment is installed. All zone valves shall be placed in a Rainbird or approved equivalent valve box. Valve box covers shall be brought to grade using stacked valve boxes. All valve boxes shall contain three (3) inches of three quarter (3/4) inch washed rock covered with filter fabric four (4) inches below valve.

1052.12 Irrigation Heads

Consideration shall be given to water conserving equipment that minimizes spraying wherever practical.

- A. Turf Areas: All heads shall have a check valve. In large turf areas, Rainbird or approved equal gear driven heads shall be used. In turf areas wider than fifteen (15) feet, gear driven heads should be used unless overly obstructed. In turf areas narrower than fifteen (15) feet where spray heads are needed, Rainbird or approved equal heads shall be used. Each irrigation head shall have a minimum pop-up height of six (6) inches and shall be installed on a PVC swing joint consisting of three (3) street elbows and one (1) eight (8) inch or longer PVC nipple.
- B. Flower Bed Areas: Irrigation for a typical flowerbed design shall consist of a removable grid of Techline spaced at twelve (12) inches and delivering six-tenths (0.6) gallon per hour. Unions shall allow the grid to be totally removed for tilling. Removable sections shall be no larger than eight (8) feet by eight (8) feet. Multiple sections may be connected with unions to achieve coverage. A blow-off, air relief valve and a pressure indicating flag shall be installed in each bed.

- C. Shrub Beds: Shrub beds shall be irrigated by a drip system. Drip irrigation systems shall consist of $\frac{3}{4}$ -inch or 1-inch drip line with emitters installed where required. All emitters shall be pressure compensating. All laterals not in shrub beds shall be PVC pipe. The ends of the drip line shall have a ball valve and no caps. Location of ball valves shall be shown in the Record Documents. Pressure compensating Techline irrigation system may be used if approved by Elbert County. In shrub spacings of 24-inches and greater, the Techline shall be snaked in between plants ensuring three emitters per plant. In shorter spacing, Techline shall be placed on two sides of the plant to ensure proper watering. Techline shall be staked in place under the weed mat and covered with mulch. Techline in ground cover beds shall be staked in a grid to water entire area and covered with mulch. In sloped areas, the maximum length of a bed will be 60 feet with upper and lower supply header control by ball valves to adjust the flow. The Techline will be run perpendicular to the slope. The upper $\frac{2}{3}$ of the slope shall be spaced at manufacturer's recommended spacing; for the lower $\frac{1}{3}$ of the slope, increase the spacing by 25%.
- D. Trees: Tree zones shall include the following sequence of items: ball valve, Rainbird EFB-CP or equivalent electronic control valve, ball valve, Rainbird 5LRC quick coupler or equivalent and Rainbird RWS-BCG or equivalent. In native areas and shrub beds, three (3) Rainbird RWS-BCG or equivalent shall be required per tree. In turf areas, two (2) Rainbird RWS-BCG or equivalent shall be required per tree.

1052.13 Field Wiring

All wire shall be buried under and to one side of the irrigation piping. All wire shall be buried with a minimum of eighteen (18) inches cover. All wiring shall be bundled every ten (10) feet.

- A. Lead Wire for Connecting Valve to Controller: For runs less than seven thousand seven hundred (7,700) feet, the lead wire shall be #14 UF single strand, direct bury, PE jacketed, copper wire. For zones (1-24), the insulation shall be red. For zones (25-48), the insulation shall be yellow. For runs in excess of seven thousand seven hundred (7,700) feet, the lead wire shall be #12 UF.
- B. Common Wire: All common wire shall be #12 UF single strand, direct bury, PE jacketed, copper wire with white insulation
- C. Master Valve and Flow Sensor Wires: The Bermad 910-P master valve requires a minimum of four (4) blue, one (1) green, two (2) brown, and one (1) gray #14 AWG wire. As an alternate, the master valve shall require three (3) brown and two (2) gray wires, and the flow sensor shall require two (2) blue and two (2) green #14 AWG wires.

- D. Connectors: Only Snap-loc water-tight connectors shall be used to make wire connections, including connections in valve boxes.

1052.14 Pipe

All PVC pipe shall be continuously and permanently marked showing the manufacturer's name, the size, and the class of the pipe. All PVC pipe shall conform to the requirements of IPS pressure pipe, ASTM D2241. Pressure pipe greater than six (6) inches shall comply with AWWA C-900. Irrigation main pipe shall be installed with tracer wire and warning tape, and shall comply with Section 432.19 Tracer Wire and Warning Tape of these CONSTRUCTION STANDARDS & SPECIFICATIONS. Tracer wire shall be terminated in isolation valve boxes.

The velocity of the water through PVC pipe shall not exceed five (5) feet per second. The velocity of the water through copper pipe shall not exceed nine (9) feet per second. Irrigation system piping shall be as follows:

- A. Primary water service line (from water main) shall comply with Section 442.01 Water Service Lines of these CONSTRUCTION STANDARDS & SPECIFICATIONS.
- B. Secondary water service line (from water meter to backflow preventer) shall be either ductile iron or type "K" rigid copper pipe. Copper fittings less than three (3) inches diameter shall be soldered together using lead-free solder. Three (3) inch copper fittings shall be soldered together using silver solder.
- C. Irrigation main pipe less than six (6) inch diameter shall be ASTM D2241 Class 200 (SDR 21), an alternate may be approved by the Road & Bridge Superintendent / Elbert County Engineer. One (1) inch to three (3) inch diameter pipe shall be solvent weld type and shall use ASTM F656 purple primer and ASTM D2564 glue. Four (4) inch diameter pipe shall be intergral bell gasketed.
- D. Irrigation main pipe six (6) inch diameter and larger shall be AWWA C900 Class 200 (DR-14), an alternate may be approved by the Road & Bridge Superintendent / Elbert County Engineer. .
- E. All gasketed pipe shall be restrained in compliance with Section 433.06 Thrust Blocking, Restrained Joints and Fittings of these CONSTRUCTION STANDARDS & SPECIFICATIONS.
- F. The lateral lines shall be Class 200 (SDR 21) PVC pipe, an alternate may be approved by the Road & Bridge Superintendent / Elbert County Engineer and shall be assembled using the same primer and glue noted in Section 1052.14 c above. No main or lateral line pipe shall be smaller than one (1) inch diameter PVC.

All gasketed pipe shall be restrained by thrust blocks and mechanical joint restraint as required in these CONSTRUCTION STANDARDS &

SPECIFICATIONS. Mechanical joint restraint (wedge action, self-actuating, such as Megalugs) shall be used for fittings such as—but not limited to—directional elbows, directional tees, and gate valves. Push-on fittings may be allowed for bends less than ninety (90) degrees with proper thrust blocks and rebar restraint.

1052.15 Quick Coupler Valves

When there is a looped mainline, quick coupler valves shall be located at various points or where directed by Elbert County. This valve shall be a Rainbird No. 5LRC or equivalent with restrained joints, and shall be both vinyl-covered and locking. It shall be installed in a ten (10) inch diameter valve box as manufactured by Rainbird or approved equal

1052.16 Manual Drain Valves

All main lines shall have a minimum of two manual drain valves, one on either side of the backflow preventer. Drain valves shall be one (1) inch diameter ball stop valves. One drain valve shall be installed inside the meter pit. One drain valve shall be installed on the downstream side of the backflow preventer. Access to the downstream drain valve shall be provided a two (2) inch diameter PVC sleeve with a “Snug Cap” or approved equal. This shall be enclosed in a ten (10) inch diameter valve box manufactured by Rainbird or approved equal. All manual drains shall discharge into a gravel sump containing a minimum of three (3) cubic feet of three-fourths (3/4) inch washed rock. The top surface of the rock shall be covered with filter fabric.

1052.17 Isolation Valves

Isolation valves shall be installed at locations noted on the approved plans and at both sides of a street crossing. Isolation valves two (2) inch diameter and larger shall be Clow or approved equal and shall comply with Section 432.05 Gate Valves and Section 442.10 Valves for Use with Meters of these CONSTRUCTION STANDARDS & SPECIFICATIONS. Valves one and one-half (1 ½) inches diameter or smaller shall be brass gate valves with cross handles and resilient seats. Direction of valve operation shall comply with Section 432.05 Gate Valves of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1052.18 Pressure Reducing Valves

When main line static pressure exceeds one hundred (100) psi, a pressure reducing valve approved by Elbert County shall be installed in an in-ground enclosure and shall comply with these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1052.19 Sleeving

Only irrigation equipment shall be installed in irrigation sleeves. Irrigation wiring and piping installed in separate sleeves under sidewalks, curbs, roadways or similar structures shall be sleeved.

Sleeves shall be PVC IPS pressure pipe, SDR-26 or heavier, and shall be a minimum of one and one-half (1 ½) inches larger inside diameter than the maximum outside diameter (bell) of the pipe to be installed through it. Sleeves shall extend a minimum of twelve (12) inches beyond the edge of the sidewalk, curb, roadway or similar structure. The location of the sleeve shall be permanently marked on the structure that is crossed under.

1052.20 Materials for Use With Reclaimed Water

Materials used in reclaimed water irrigation systems shall comply with reclaimed water standards and shall be purple in color, or if approved, may be clearly marked as reclaimed. Materials covered by this requirement include (but are not limited to) meters, valves, quick couplers, valve box covers, irrigation heads, techline, hosebibs and warning tape. Reclaimed water connection point following the meter pit shall consist of, in consecutive order: (1) isolation valve, (1) ball stop drain and (1) quick coupler.

1053.00 Site Conditions

The Contractor shall coordinate his work with that of other trades to prevent conflicts.

Changes or alterations in the system to meet site conditions shall be subject to Elbert County approval. Contractor shall prepare a set of Record Documents Section 200.00 Acceptance Procedures of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

The Contractor shall be responsible for providing electrical requirements required for the job. The appropriate electrical utility (Xcel Energy or United Power) should be contacted for information on possible electrical sources. All electrical work, except 24 volt, shall require a separate inspection by the Elbert County Building Official.

1054.00 Excavation

All applicable portions of Section 350.00 Trenching, Backfilling and Compacting of these CONSTRUCTION STANDARDS & SPECIFICATIONS, shall apply. When approved by the Road & Bridge Superintendent / Elbert County Engineer, trench excavation and backfill for irrigation systems in excess of the limits noted in Section 350.00 may be allowed.

1055.00 Process

1055.01 Staking

Contractor shall ensure that all existing utilities are field located. Prior to new construction, locations of proposed irrigation lines, sprinkler heads and system equipment shall be staked. Stakes shall be color coded for materials and maintained throughout the sprinkler installation process.

1055.02 Pump House

When a pump house is used, the secondary water service line shall be extended a minimum of twenty-four (24) inches below grade on the discharge side of the pump house and a minimum of twenty-four (24) inches beyond the pump house slab or footing.

1055.03 Pipe Assembly

The adaptation from copper to PVC shall be made by using a female copper adapter receiving a male PVC adapter.

PVC pipe shall comply with Section 1052.14 Pipe of these CONSTRUCTION STANDARDS & SPECIFICATIONS. All excess glue shall be wiped from the joint with a cloth rag or similar material after assembly. Elbert County shall not allow gluing of pipe unless the temperature is forty (40) degrees and rising for one hour. Install purple insulated tracer wire and purple warning tape along all main line pipe. Install tracer wire and blue warning tape along all potable water pipe. All threaded PVC fittings shall receive a double wrap of Teflon tape prior to assembly.

1055.04 Trenching

All pipes shall be installed along the center of an excavated trench to approved lines and grades. Trenches shall be dug true to the alignments shown on the approved plans. All bends shall be made with fittings. Excavation of the trenches shall be done in a workman-like manner with a flat bottom containing no rocks or other deleterious material that may damage the pipe.

Separate trenches shall be dug for each line. No doubling up of lines in a single trench shall be allowed. Trenches shall be dug deep enough to allow the following cover over the top of the pipe:

Main Line Size	Minimum Cover	Maximum Cover
1" – 1 ½"	18"	24"
2" - 3"	24"	36"
Greater than 3"	36"	48"

Lateral Line Size		Minimum Cover	Maximum Cover
1"- 3"	Gear Driven Rotors	18"	24"
1"- 3"	6" Pop-Up Spray Heads	12"	24"
1"- 3"	12" Pop-Up Spray Heads	18"	24"
> 3"	6" or 12" Pop-Up Spray Heads	18"	24"

No trench shall be left open overnight without specific prior approval by Elbert County and without sufficient barricades to protect the public. Barricades shall comply with Section 141.12 Traffic Control, Barricades and Warning Signs of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1055.05 Control Valves

Control valves shall be installed eight (8) inches below the bottom of the valve box lid. Stacked valve boxes shall be used to bring the cover of the valve box to the finished grade. All irrigation boxes should be permanently marked with two (2) inch high numbers or letters as follows: Master Valve (MV), Isolation Valve (GV), Quick Coupler (QC), Grounding Rod (GR), Wire Splice (WS), Manual Drain (MD). Zone valve boxes shall be marked as follows: (Timer A, B, C, etc.– Zone #). For example, markings shall read “(A2)” or “(B19)”.

1055.06 Backfill

Backfill material shall be free of rocks one (1) inch in diameter and larger. Backfill shall comply with Section 354.00 Backfill for Pipelines and Service Lines of these CONSTRUCTION STANDARDS & SPECIFICATIONS. Compaction of soils in landscape areas shall be between eighty (80) and eighty-five (85) percent of the Standard Proctor per ASTM D698.

1055.07 Turn-On and Winterization

The Contractor shall start up the system in the spring and shall perform any necessary service work. In the fall, the Contractor shall shut down and protect the system from freezing.

1056.00 Inspections

A copy of the approved construction plans, these CONSTRUCTION STANDARDS & SPECIFICATIONS, and the project inspection sheets shall be onsite at all times. Any allowable variances from the approved construction plans shall be noted on the project inspection sheets by the Elbert County Inspector/Representative.

The Contractor shall request the following required inspections twenty-four (24) hours in advance:

1056.01 Trailer Inspection

Elbert County shall inspect the storage area and equipment and materials trailer before any irrigation system installation begins. The results of the trailer inspection not withstanding, only approved materials and equipment shall be allowed.

1056.02 Sprinkler Location Staking

Elbert County shall inspect the staked locations of all lines and heads for conformance to the approved plans and these CONSTRUCTION STANDARDS & SPECIFICATIONS. Elbert County reserves the right to move, shift and adjust any of the stakes to better achieve the design intentions. No trenching shall be done until the inspection is complete and the staked locations approved by Elbert County.

1056.03 Main Line Inspection

Prior to trench backfilling, Elbert County shall inspect the depth of pipe, trust blocking, manual drain valves, sumps, control valves and wiring for conformance to the approved plans and these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1056.04 Pressure Test

The contractor shall pre-test the system prior to requesting an inspection. All main lines shall be pressure tested to one-hundred fifty (150) psi at the low point of the section being tested. The maximum loss shall be five (5) psi in one hour.

All valve boxes shall be opened and ball valves shall be open and flagged for inspection. Prior to a pressure test, the zone valves shall be wired.

1056.05 Wiring Inspection

When the wiring installation has been completed, Elbert County shall inspect it for conformance with the approved plans and these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1056.06 Coverage Test

Upon completion of all irrigation system installation, the Contractor—in the presence of Elbert County—shall perform a coverage test. Prior to the coverage test, the controller shall be wired and set to Elbert County frequency. The controller shall respond to the hand held radio or no test shall be performed.

1057.00 Turn-On and Winterization

In the Fall, the Contractor shall shut down and protect the system from freezing. The Contractor shall start up the system in the spring and shall perform any necessary service work. Elbert County shall be notified prior to landscape irrigation system winterization and spring turn-on. Refer to Section 200 Acceptance Procedures of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1058.00 Acceptance and Warranty

Acceptance and warranty shall comply with the requirements of Section 200 ACCEPTANCE PROCEDURES of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1060.00 PLANTING SPECIFICATIONS**1061.00 General**

The scope of work involves furnishing all plants, equipment, materials, labor and supervision necessary for the installation of plant materials as indicated on the approved plans and in these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1062.00 Materials**1062.01 Mulch and Edging**

All trees shall be mulched with materials of a fibrous nature, such as shredded wood chips or shavings, which are between two (2) inches and eight (8) inches in length and are placed to a depth of three (3) inches around each tree. In specific cases, when approved by Elbert County, cobble or rock mulch may be substituted for the fibrous mulch. If edging is used, it shall be six (6) inch wide and fourteen (14) minimum gauge painted steel.

1062.02 Staking and Guying

All trees shall be staked and guyed using the following material:

- A. Stakes: Six (6) feet tall steel tee posts
- B. Wires: A double strand of number sixteen (16) galvanized wire
- C. Nylon straps: One and one-half (1 ½) inch wide nylon strap with eyelets at each end.

1062.03 Ornamentals, Perennials, Shrubs and Trees

The Contractor shall furnish and install all plants shown on the approved plans.

All plant materials shall:

- A. Be alive, healthy and freshly dug
- B. Have a normal, well developed branch and root system
- C. Show good annual growth
- D. Have plump buds, well fitted for the species

Evergreen foliage shall have a good intense color. Trees shall contain a central dominant leader with evenly spaced branches. Foliage and branches shall be distributed on the upper two-thirds (2/3) of the tree. The trunk shall taper from a solid base to a more slender diameter at the top.

All plant materials shall be free from:

- A. Defects or mechanical damage
- B. Disfiguring knots
- C. Bark abrasions and discolorations
- D. Plant diseases and all forms of infestations
- E. Wilted leaves
- F. Insect eggs and borers

Plants with damage shall be rejected.

Plant tags stating the correct plant name and size shall be securely attached to all plant materials.

Balled roots shall be firmly wrapped with burlap or similar material and bound with rope or wires. Roots shall not be girdling, circling or potbound. Plants with broken root balls shall not be installed. Any plant that is loose in the ball shall not be installed.

All plant materials shall conform to the measurements noted in the plant specifications and on the approved plans. The following are minimum sizes:

- A. Deciduous trees – two (2) inch caliper or larger
- B. Coniferous Evergreen trees – six (6) feet tall or larger
- C. Shrubs – number five (5) container
- D. Ornamentals and perennials – number one (1) container

BALL SIZE – DECIDUOUS TREES

Tree Size	Ball Depth Minimum (in.)	Ball Diameter Minimum (in.)
2" - 2-1/2" caliper	20	24
2-1/2" - 3" caliper	22	28
3-1/2" - 4" caliper	30	38
5' - 6' height	14	16
6' - 8' height	16	18

BALL SIZE -- CONIFEROUS EVERGREEN TREES**

Types 1, 2 and 3		Types 4 and 5		Type 6	
Spreading, semi-spreading, globe and compact upright		Pyramidal, broad upright		Columnar	
Spread (Types 1 and 2) Height (Type 3) (in.)	Minimum diameter ball (in.)	Height/ caliper (in.)	Minimum diameter ball (in.)	Height/ caliper (in.)	Minimum diameter ball (in.)
9	8	12	8	12	7
12	10	15	10	15	8
15	12	18	12	18	9
18	14	24	14	24	11
24	16	30	16	30	13
30	18	36	18	36	14
36	24	48	20	48	16
42	26	60	22	60	18
48	28	72	24	72	20
60	36	84	26	84	22
72	40	96	28	96	24
84	46	111	32	110.5	26
96	52	111.5	34	111	28
		112	38	111.5	32
		112.5	42	112	36
		113	48	112.5	40
		113.5	54	113	44
		114	60	113.5	48
		115	72	114	54
		116	84	115	66
		117	90	116	78
				117	90

**** Notes:**

- A. Plant sizes and caliper measurements indicate minimum size in the size interval (e.g., "4 ½ in." caliper indicates 4 ½ - 5 in. caliper interval).
- B. Rapid growing varieties may have root balls one size smaller.
- C. Check with American Standard for Nursery Stock for exact specifications of each species.)

1062.04 Weed Barrier Fabric

All shrub beds and mulched areas shall have a continuous layer of weed barrier fabric installed under the mulch. It shall be Mirafi 140NSL fabric with 4.3 oz. per square yard, or an approved equal. Bed areas with perennial plants shall not require weed barrier fabric. The fabric should be cut around plant material, and not tucked and folded.

1062.05 Backfill Mixture

BACKFILL MIXTURE FOR ANNUAL PLANT MATERIALS SHALL BE A MIX OF ONE-THIRD (S) ORGANIC MATERIAL MIXED WITH NATIVE MATERIAL. REFER TO SECTION 1022.01 ORGANIC MATERIALS OF THESE CONSTRUCTION STANDARDS & SPECIFICATIONS. BACKFILL MIXTURE FOR TREES AND SHRUBS SHALL BE NATIVE MATERIAL.

1063.00 Landscaping

Xeriscape or other landscape plans may be permitted with the approval of Elbert County.

1063.01 Street Right-of-Way (R.O.W.)

The following landscape requirements for street R.O.W. and interchanges shall apply:

Landscape Requirements for Local and Connector Streets

	Quantity Minimums	Arrangement	Ideal Locations	Unacceptable Locations	Purpose	Specifics
DECIDUOUS SHADE TREES	1 TREE/LOT	FORMAL	LANDSCAPE STRIPS	MEDIANS	SHADE/MASSING	MINIMUM OF 35' SPACING
CONFEROUS EVERGREEN TREES	N/R	N/R	N/R	N/R	N/R	N/R
ORNAMENTAL TREES	1 TREE/LOT	INFORMAL	FRONT YARD	SIGHT TRIANGLES	ACCENT	MINIMUM OF 15' SPACING
DECIDUOUS SHRUBS	N/R	CLUSTERED, INFORMAL	FRONT YARD	SIGHT TRIANGLES (SHRUBS OVER 2'-0")	MASSING	
EVERGREEN SHRUBS	N/R	CLUSTERED, INFORMAL	FRONT YARD	SIGHT TRIANGLES (SHRUBS OVER 2'-0")	MASSING	
PERENNIALS	N/R	N/R	SIGHT TRIANGLES/INTERSECTION, CORNERS, FRONT YARD	ALONG LENGTH OF STREET	ACCENT	LOW MAINTENANCE
TURFGRASS	FRONT YARD	N/R	LENGTH OF STREET/CORNERS	4:1 OR STEEPER SLOPES	GROUND COVER	LOW WATER USE TURF
MOSS ROCK BOULDERS	N/R	CLUSTERED	SHRUB, PERENNIAL BEDS	LAWN AREAS	ACCENT, SLOPE STABILIZATION	MOSS ROCK, 36" MINIMUM SIZE
BERMS	N/R	N/R	ALONG LENGTH OF STREET	SIGHT TRIANGLES	SCREEN, VISUAL INTEREST	BERMS AT MAX 4:1 SLOPE

*N/R represents not relevant at this location.

Landscape Requirements for Minor Arterials

	Quantity Minimums	Arrangement	Ideal Locations	Unacceptable Locations	Purpose	Specifics
DECIDUOUS SHADE TREES	1 TREE/60'	FORMAL	LANDSCAPE STRIPS	MEDIANS	SHADE/MASSING	MINIMUM OF 35' SPACING
CONFEROUS EVERGREEN TREES	1 TREE/90'	INFORMAL, INTERMIXED	LANDSCAPE TRACT	SIGHT TRIANGLES, MEDIANS & WITHIN 55' OF R.O.W.	ACCENT, SCREEN	MINIMUM OF 25' SPACING
ORNAMENTAL TREES	1 TREE/120'	INFORMAL, INTERMIXED	LANDSCAPE TRACT, MEDIANS & INTERSECTIONS	SIGHT TRIANGLES, WITHIN 55' OF R.O.W.	ACCENT	MINIMUM OF 15' SPACING
DECIDUOUS SHRUBS	½ OF SHRUB MATERIAL	CLUSTERED, INFORMAL	ALL	SIGHT TRIANGLES (SHRUBS OVER 2'-0")	MASSING	
EVERGREEN SHRUBS	½ OF SHRUB MATERIAL	CLUSTERED, INFORMAL	FRONT YARD	SIGHT TRIANGLES (SHRUBS OVER 2'-0")	MASSING	

Landscape Requirements for Minor Arterials (continued)

	Quantity Minimums	Arrangement	Ideal Locations	Unacceptable Locations	Purpose	Specifics
PERENNIALS	N/R	N/R	SIGHT TRIANGLES/INTERSECTION, CORNERS	ALONG LENGTH OF STREET, MEDIAN	ACCENT	LOW MAINTENANCE
TURFGRASS	FRONT YARD	N/R	LENGTH OF STREET/CORNERS	4:1 OR STEEPER SLOPES	GROUND COVER	LOW WATER USE TURF
MOSS ROCK BOULDERS	N/R	CLUSTERED	SHRUB, PERENNIAL BEDS, MEDIAN, STEEP SLOPES	LAWN AREAS	ACCENT, SLOPE STABILIZATION	MOSS ROCK, 36" MINIMUM SIZE
BERMS	N/R	N/R	ALONG LENGTH OF STREET	SIGHT TRIANGLES	SCREEN, VISUAL INTEREST	BERMS AT MAX 4:1 SLOPE

*N/R represents not relevant at this location.

Landscape Requirements for Major Arterials

	Quantity Minimums	Arrangement	Ideal Locations	Unacceptable Locations	Purpose	Specifics
DECIDUOUS SHADE TREES	1 TREE/50'	FORMAL	LANDSCAPE STRIPS	MEDIAN	SHADE, MASSING	MINIMUM OF 35' SPACING
CONIFEROUS EVERGREEN TREES	1 TREE/100'	INFORMAL, INTERMIXED	LANDSCAPE TRACT	SIGHT TRIANGLES, MEDIAN & WITHIN 65' OF R.O.W.	ACCENT, SCREEN	MINIMUM OF 25' SPACING
ORNAMENTAL TREES	1 TREE/60'	INFORMAL, INTERMIXED	LANDSCAPE TRACT, MEDIAN & INTERSECTIONS	SIGHT TRIANGLES, WITHIN 65' OF R.O.W.	ACCENT	MINIMUM OF 15' SPACING
DECIDUOUS SHRUBS	½ OF SHRUB MATERIAL	CLUSTERED, INFORMAL	ALL	SIGHT TRIANGLES (SHRUBS OVER 2'-0")	MASSING	
EVERGREEN SHRUBS	½ OF SHRUB MATERIAL	CLUSTERED, INFORMAL	ALL	SIGHT TRIANGLES (SHRUBS OVER 2'-0")	MASSING	
PERENNIALS	N/R	N/R	SIGHT TRIANGLES, INTERSECTION CORNERS	ALONG LENGTH OF STREET	ACCENT	LOW MAINTENANCE
TURFGRASS	N/R	N/R	LENGTH OF STREET, CORNERS	4:1 OR STEEPER SLOPES	GROUND COVER	LOW WATER USE TURF
MOSS ROCK BOULDERS	N/R	CLUSTERED	SHRUB, PERENNIAL BEDS, MEDIAN, STEEP SLOPES	LAWN AREAS	ACCENT, SLOPE STABILIZATION	MOSS ROCK, 36" MINIMUM SIZE
BERMS	N/R	N/R	ALONG LENGTH OF STREET	SIGHT TRIANGLES	SCREEN, VISUAL INTEREST	BERMS AT MAX 4:1 SLOPE
SITE FURNITURE	1 BENCH/300'	DISPERSED	ALONG LENGTH OF STREET	SIGHT TRIANGLES, MEDIAN	PEDESTRIAN USE	BENCHES, TRASH RECEPTACLES, & LIGHTING

*N/R represents not relevant at this location.

1063.02 Mow Strip

Concrete or crushed rock mow strips shall be constructed around all grouted rock areas and utilities, including fire hydrants, phone boxes, cable boxes, light fixtures and traffic controller boxes.

Mow strips shall be placed along ballfield fencing and in site specific fenced areas in Open Space. They shall be six inches (6") thick and eighteen inches (18") wide, and fencing shall be centered over the mow strip.

All materials and locations shall be determined and approved by Elbert County.

1063.03 Ditch Banks

All ditch banks, inlets or outlets lined with rock or cobblestone shall be grouted and contained by a mow strip. Materials and locations shall be determined and approved by Elbert County.

1063.04 Annual Flower Beds

Annual flower beds shall be designed for high visibility areas in parks or traffic medians. They shall have separate irrigation system specific for beds. The beds shall have six (6) inches of native soil removed and replaced with five (5) inches of approved top soil. Elbert County may amend with organic materials at the time of planting.

1064.00 Planting**1064.01 Location Staking**

The Contractor shall stake the proposed locations of all trees and shrubs on-site for approval by Elbert County prior to planting. Elbert County reserves the right to move, shift or adjust any or all of the stakes to better achieve the planting design intentions as shown on the approved drawings.

The Contractor shall arrange to have the locations of all utility lines (including but not limited to water, sewer, gas, electrical, phone and irrigation) marked prior to the inspection.

1064.02 Seasons of Planting

Planting may occur whenever the soil conditions are favorable or as authorized by Elbert County. All conifers planted in Candle growth stage shall be hand foliage watered by the Contractor for a period of one (1) week after planting.

1064.03 Planting Procedures

The size of tree pits shall be two (2) times the diameter of the root ball and deep enough so that the tree's root flair remains two (2) inches higher than finished grade after settling has occurred. The sides of the tree pit shall taper inward to the bottom of the hole.

The size of shrub pits shall be twelve (12) inches in diameter greater than the container diameter and as deep as necessary to properly set the plant.

All plants shall be set plumb and in the center of the pit. The root ball shall be set on compacted backfill mix.

Balled and burlapped trees shall be set with backfill mixture. Backfill mixture shall be thoroughly blended prior to placement in the pit or planter bed. After placing the backfill mixture around the root ball, thoroughly water the plant to remove all voids.

REMOVE ALL ROPES OR WIRES FROM THE BASES OF TREES AND SHRUBS. REMOVE WIRE BASKETS FROM ROOT BALLS BEFORE TREES AND SHRUBS ARE BACKFILLED. REMOVE CONTAINERS (INCLUDING ORGANIC MANUFACTURED BASKETS) FROM CONTAINER-GROWN PLANT MATERIALS PRIOR TO PLANTING.

Plant materials stored on site shall be watered daily. Plant materials stored on site for more than forth-eight (48) hours shall be healed in with mulch.

Compaction of soils in landscape areas shall be between eighty (80) and eighty-five (85) percent of the Standard Proctor per ASTM D698.

1064.04 Pruning

After installation, broken and dead branches shall be removed. All pruning shall be performed with clean, sharp, sterile tools.

1064.05 Tree Wrapping

After installation, all deciduous trees shall be wrapped from November 1st until April 1st of the following year. No wrapping shall be permitted until the trees have been inspected by Elbert County. The trunks of all trees shall be wrapped spirally from bottom to top, overlapping the seams and entirely covering the trunk from the ground up to the second branch. The tree wrap shall be neat, snug and secured with vinyl electric or duct tape at twenty-four (24) inch intervals or tape approved by Elbert County. Only approved four (4) inch wide tree wrap shall be used.

1064.06 Staking and Guying

Immediately after installation, all deciduous and coniferous evergreen trees shall be staked and guyed. Staking and guying shall be done with six (6) foot tall steel tee posts. Three (3) stakes in a triangle formation shall be used for coniferous trees. Two (2) stakes shall be used for deciduous trees up to three (3) inches in diameter, and three (3) stakes shall be used for trees larger than three (3) inches in diameter. Stakes shall be placed in undisturbed ground within the tree mulch ring. The tree shall be guyed using a one and one-half (1 ½) inch wide nylon strap with eyelets in each end. A double strand of galvanized wire shall be used to connect the nylon strap to the steel tee post. Proper tension on the guy wires shall be obtained by twisting the double strands of wire. Large trees may require additional tree posts and guys. Materials shall comply with Section 1062.02 Staking and Guying of these CONSTRUCTION STANDARDS & SPECIFICATIONS. .

1064.07 Fertilizing

Trees and shrubs shall not be fertilized for the first twelve (12) months after installation.

1064.08 Mulching

After installation of all plant material, the Contractor shall construct a three (3) inch high earth berm built around the tree to form a saucer. The diameter of the saucer shall be twice the diameter for deciduous trees root ball and at the drip line for coniferous evergreen trees. Mulch shall be placed in the saucer to the depth of the berm and taper to the plant crown. A small gap shall be left between the tree trunk and the mulch. Mulch shall comply with Section 1062.01 Mulch of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1064.09 Shrub Beds and Mulched Areas

In areas where plants are grouped into beds, or in areas where gravel, rock or wood mulch is to be used as a ground cover, the entire bed shall be excavated to a depth of three (3) inches , a layer of weed barrier fabric shall be installed, and three (3) inches of suitable ground cover, such as wood mulch or rock, shall be placed over it. All seams in the fabric shall overlap a minimum of twelve (12) inches.

1064.10 Clean-Up

The project site shall be kept clean. Rope, wire, burlap, empty containers, rocks, clods and other debris shall be allowed to accumulate on the site. Soil excavated from plant pits and planter beds and debris shall be removed from the site. Upon completion of the planting, all excess soils, rocks and debris, which have not previously been cleaned up, shall be removed from the site or disposed of.

1064.11 Transportation of Plant Materials

All plant material shall be covered with shade cloth tarps or enclosed so the plant material is protected from the wind and sun during transportation.

1065.00 Maintenance

The Contractor shall be responsible for all maintenance following installation of all plant material and shall continue maintenance procedures until the project has been accepted by the end user. Maintenance shall include hand watering, weeding, spraying, cultivating, trimming, mulching, wrapping, tightening and repairing of guy wires, removal and replacement of all dead materials, and resetting plants to proper grades and upright positions as required. Planting stock, replaced under warranty, shall be warranted for an additional year,

1066.00 Inspections

The Contractor shall request the following required inspections at least twenty-four (24) hours in advance:

1066.01 Plant Location Staking

Elbert County shall inspect the plant location stakings prior to the installation of any plant materials specified in Section 1064.01 Location Staking of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1066.02 Quantity and Quality of Plant Material

Elbert County shall inspect the plant material following their delivery to the site and prior to the planting on the site. Elbert County reserves the right to reject any plant not meeting the approved design requirements for size, shape and conditions at that time.

1066.03 Planting Operations

Elbert County shall inspect the planting operations, including digging, planting, pruning, wrapping, fertilizing and mulching.

1070.00 RECREATION EQUIPMENT**1071.00 General**

Selection of recreation equipment shall be approved by the Superintendent / Elbert County Engineer prior to purchase by the Contractor. In selecting equipment, the brand, style, color, size and other criteria shall be considered and jointly selected by

the Contractor and Elbert County. All installations of equipment shall be done by the Contractor.

1072.0 Ballfield Specifications

Adequate drainage shall be taken into account in ballfield designs. Infield slopes shall be between one and one-half (1 ½) percent and two (2) percent. Infield shall be designed so that drainage falls away from infield surface. Outfield slopes shall be between one and one-half (1 ½) percent and two and one-half (2 ½) percent. Outfield shall be designed so that drainage falls away from infield surface.

1072.01 Softball Infield

Infields shall be cut on a seventy (70) foot arc from the back center of the pitching plate. Home plate shall be twenty-five (25) feet from the backstop, and the foul line shall be twenty-five (25) feet from wing fences. The pitching plate shall be located fifty (50) feet from the back point of home plate. Up to three (3) sets of base receptacles shall be provided to accommodate play of different age groups. Infields shall include at least (3) irrigation heads designated to water the infield surface. The irrigation head layout design shall be approved by Elbert County before installation.

1072.02 Baseball Infield

Infields shall be cut on a ninety-five (95) foot arc from the back center of the pitching plate. Home plate shall be thirty-five (35) feet from the backstop with foul lines thirty-five (35) feet from wing fences. The pitching plate shall be located sixty (60) feet six (6) inches from the back point of home plate. Up to three (3) sets of base receptacles shall be provided to accommodate play of different age groups. Infields shall include at least (3) irrigation heads designated to water the infield surface. The irrigation head layout design shall be approved by Elbert County before installation.

1072.03 Field Composition

The infield area shall be excavated eight (8) inches below grade and eight (8) inches of suitable infield mixture, consisting of a computer blended ninety (90) percent sand and ten (10) percent silt/clay, shall be installed, leveled, and compacted to a firm, smooth surface. All mixtures shall be approved by Elbert County prior to installation.

1072.04 Field Drainage

All areas outside of ballfield fencing such as concrete bleacher pads, walks and landscaping shall be graded to drain away from the field surface.

1072.05 Fencing

- A. Fabric:
 - 1. All chain link fabric shall be six (6) gauge, knuckled selvage top; barbed or knuckled selvage bottom; two and one-half (2 ½) inch mesh.
- B. Posts and rails:
 - 1. Backstop support posts shall be 4" minimum 7.29 lbs. per foot of pipe.
 - 2. Terminal and gate posts shall be 2-7/8" O.D. minimum 4.64 lbs. per foot of pipe.
 - 3. Line posts shall be 2-3/8" O.D. minimum 3.117 lbs. per foot of pipe.
 - 4. Top rail and horizontal bracing shall be 1-5/8" O.D. minimum 1.836 lbs. per foot of pipe.
- C. Fittings and Hardware:
 - 1. Top rail caps, rail end caps, brace bands, tension bands etc. shall be pressed steel or cast steel; all commercial quality.
 - 2. Nuts and bolts shall be commercial fencing quality.
 - 3. All top rail caps shall be rounded top with no points or extrusions.
- D. Wire and ties:
 - 1. Post and rail tie wires shall be #12 ½ gauge steel.
 - 2. Tension wire shall be #7 gauge steel wire.
 - 3. Tension bar shall be 3/16" X ¾" steel.
- E. Dimensions:
 - 1. Backstops shall be twenty (20) feet high, twenty (20) feet across the back with ten (10) feet wings. Baseball backstops shall include a hood. The hood on baseball backstops can be nine (9) gauge fabric.
 - 2. Wing fences and dugout faces shall be ten (10) feet high from the backstop to a point one-hundred (100) feet out on line.
 - 3. Wing fences, from the ten (10) feet high section to the home run fence (if applicable) shall be four (4) high.
 - 4. Dugout sides and backs shall be six (6) feet high.
 - 5. Home run fences shall be eight (8) feet high.
 - 6. All posts – terminal, line, and backstop posts shall be spaced ten (10) feet apart or less, with even spacing; except for dugouts.

1072.06 Dugout Covers

All dugouts shall be covered with a wood framed metal roofed structure to be approved by the Road & Bridge Superintendent / Elbert County Engineer prior to installation.

1073.00 Playground Equipment**1073.01 Proposal Submittals**

The manufacturer's representative shall provide the following items and information to Elbert County with each playground proposal:

- A. Complete three-dimensional drawings of equipment.
- B. Individual components specifications and schematic drawings of the play system.
- C. A minimum of three (3) references for similar work recently completed. Each reference shall include a brief summary of work completed, location, and the owner's representative name and phone number.
- D. A schedule of work that includes the time it shall take to order and receive the playground equipment and the time it shall take to install once the play equipment is delivered.
- E. The name and qualifications of the installer of playground equipment.
- F. A letter from the manufacturer stating that the playground equipment shall meet or exceed the latest Consumer Product Safety Commission Guidelines and ASTM F1487. Letters from the manufacturers shall reference the model number or drawing numbers of each unit.
- G. Copies of warranty information for playground equipment to Elbert County. Warranties shall include minimum: ten (10) years on posts and decks; five (5) years on plastic; ten (10) years on clamps, and one (1) year on all other parts.

1073.02 Safety and ADA Requirements

All playground equipment shall meet or exceed the latest CPSC Handbook for Public Playground Safety Guidelines. All play equipment and the protective ground space area around the equipment shall meet or exceed ASTM F1487 Standard Consumer Safety Performance Specifications for Playground Equipment for public use.

All playground equipment shall comply with the current ADA law using ASTM F1487. This can be accomplished either by a safety surface or a ramp system as determined by Elbert County. The safety surface shall be an ADA approved surface (poured in place) for accessing the transfer point. The color of the surface shall be approved by Elbert County.

1073.03 Protective Ground Space Area

The play system layout for each site shall include a safety surface area surrounded by a protective barrier. The safety surface material shall be selected by Elbert County. The safety surface area shall be installed to a depth of twelve (12) inches to eighteen (18) inches depending upon the components. A sub-surface drainage system shall be installed under each protective surface area and shall be separated from the finish surfacing by a layer of landscape fabric. The design of the drainage system shall be approved by Elbert County.

The composition of the barrier for protective ground space area shall be approved by Elbert County.

1073.04 Component Requirements

The following requirements for equipment components apply:

- A. Slides shall be double walled except for tube slides.
- B. All barrier handrail separation bars shall be less than three and one-half (3 ½) inch apart.
- C. Upper body climbers shall have end step ladders excluding overhead flyers.
- D. Components of the play system(s) for specific sites shall be approved by Elbert County. Each playground system shall include and not be limited to: roofs, climbers, slides, bridges, ladders, arches, overheads, play panels, transfer points, decks, barriers, guard rails, protective barriers and swings.
- E. Playground decks shall be a minimum of forty-seven (47) inch square. The maximum opening of holes in the deck surface shall be one-quarter (¼) inch.
- F. Component colors shall be approved by Elbert County.

1073.05 Materials

- A. Playground equipment components shall comply with the following material requirements:
- B. Wooden structures shall not be allowed.
- C. All decking and steps shall be PVC coated.
- D. Metal slides shall not be allowed.
- E. Support posts to be five (5) inch OD steel with corrosion protection and finished in powder coat with metal caps.
- F. Playground decks shall be metal with PVC coating.
- G. Deck to deck riser enclosures shall be metal.
- H. Swing support framework shall be five (5) inch OD steel with corrosion protection and finished in powder coat with metal caps.

1073.06 Installation and Inspection

A factory representative shall supervise the unloading of all materials shipped to the individual job sites. A company representative shall conduct a post-installation inspection to certify the proper installation of playground equipment.

1080.00 WALKWAYS, MAINTENANCE PATHS AND SOFT TRAILS

1081.00 Concrete Walkways and Maintenance Paths

All walkways and maintenance paths within the parks, open land areas, or greenbelts, shall be a minimum of six (6) feet wide, and shall be constructed with a minimum of four (4) inch thick concrete. The concrete shall comply with Section 800.00 CONCRETE MIX DESIGN AND CONSTRUCTION of these CONSTRUCTION STANDARDS & SPECIFICATIONS.

1082.00 Soft Trails

Trails shall generally be constructed with slope less than 12.5:1 (horizontal:vertical). Short sections of trail may be constructed up to a maximum slope of 7:1, if approved by Elbert County.

1082.01 Soft Trail Subgrade

The subgrade for soft trails shall consist of twelve (12) inches of moisture density treated native material compacted to ninety-five (95) percent relative density as determined by AASHTO T-99. Moisture density tests shall be performed at two-hundred and fifty (250) foot intervals to demonstrate proper sub-grade preparation.

1082.02 Trails With Slope Less Than 12.5:1 (Horizontal:Vertical)

Soft trails with a slope of less than 12.5:1 (horizontal:vertical) shall be constructed with six (6) inches minimum of Soft Trail Aggregate. Aggregate material shall be compacted in place to ninety-five (95) minimum of the maximum standard Proctor dry density as defined in ASTM D698.

1082.03 Trails With Slope Equal To Or Greater Than 12.5:1 (Horizontal:Vertical)

Soft trails with a slope equal to or greater than 5:1 (horizontal:vertical) shall be constructed with three (3) to five (5) inches of Soft Trail Aggregate stabilized with a binder material. The depth of the aggregate will depend on the binder material proposed. Aggregate and binder material shall be compacted in place to ninety-five (95) minimum of the maximum standard modified Proctor dry density as defined in ASTM D698.

Soft trails with a slope equal to or greater than 10:1 (horizontal:vertical) shall have cross timbers installed at twenty (20) foot intervals along the trail alignment.

- A. Binder Material: The binder material shall be approved by Elbert County prior to trail construction.
- B. Cross Timbers: Eight (8) inch by eight (8) inch pressure treated timbers. Timbers shall be installed at fifteen (15) degrees from perpendicular to the trail centerline. The top of the timbers shall be at the same level as the trail surface and the bottom of the timbers shall be keyed into the treated sub-grade. Each timber shall be anchored in place with three (3) – two (2) foot long #4 steel reinforcing bars (rebar). No part of the rebar shall protrude above the top of the timber.

1082.04 Cross Slope

Soft trails shall be constructed with a uniform two (2) percent slope from the high side of the trail to the low side. No crown shall be constructed. The intent of the cross grade is to provide sheet drainage of water across the trail and not along the trail.

1082.05 Soft Trail Aggregate

Soft trail aggregate shall be three-eighths ($\frac{3}{8}$) inch minus decomposed granite or crushed material approximating the following gradation:

Sieve Designation	Range of % Passing
3/8 inch	100
No. 4	70-100
No. 8	50-75
No. 16	30-65
No. 30	20-45
No. 50	10-30
No. 100	2-20
No. 200	0-15

Submit the specific gradation proposed for the soft trail construction. Include binder details when aggregate is intended for soft trails with a slope equal to or greater than 12.5:1 (horizontal:vertical).

Soft trail aggregate material color shall be grey unless otherwise specified.

1083.00 Underpass Lighting

Lighting for pedestrian underpasses and similar applications shall be a Fail-Safe VR 2000 DW, DC 6½" Decorative Series fixture from Cooper Lighting, or equal approved by Elbert County.

1084.00 Site Furnishings

Submittals for site furnishings such as benches, picnic tables, trash cans, dog waste stations, etc. shall be submitted to Elbert County for approval prior to installation.

1090.00 TREES, SHRUBS, ORNAMENTAL GRASSES AND PERENNIALS

Acceptable trees, shrubs, ornamental grasses and perennials for landscaping in Elbert County are included in the following lists. Other plant materials may be submitted for review and approval by Elbert County. Preference shall be given to drought resistant species.